

WHAT IS CLAIMED IS:

1. A fixing device comprising:

a substantially cylindrical heat roller that is used for fixing toner on paper;

5 a center heater disposed within the heat roller, the center heater being located at a center region in a longitudinal direction of the heat roller and at a position displaced in a first direction from a diametrical center position of the heat roller;

10 a side heater disposed within the heat roller, the side heater being located at a side region in the longitudinal direction of the heat roller and at a position displaced in a second direction from the diametrical center position of the heat roller;

15 a first temperature detection element that detects a surface temperature of the heat roller at a position where a position in the longitudinal direction of the heat roller corresponds to the center heater; and

 a second temperature detection element that is
20 positioned in phase with the first temperature detection element in a circumferential direction of the heat roller, and detects a surface temperature of the heat roller at a position where a position in the longitudinal direction of the heat roller corresponds
25 to the side heater.

2. The fixing device according to claim 1, further comprising a power supply turn-off element

that turns off power to the center heater and the side heater when the surface temperature of the heat roller reaches a predetermined turn-off temperature,

wherein the first temperature detection element
5 and the second temperature detection element are positioned in a phase different from a phase of the power supply turn-off element.

3. A fixing device comprising:

a substantially cylindrical heat roller that is
10 used for fixing toner on paper;

a center heater disposed within the heat roller, the center heater being located at a center region in a longitudinal direction of the heat roller and at a position displaced in a first direction from
15 a diametrical center position of the heat roller;

a side heater disposed within the heat roller, the side heater being located at a side region in the longitudinal direction of the heat roller and at a position displaced in a second direction from the
20 diametrical center position of the heat roller;

a drive mechanism that rotates the heat roller in a circumferential direction thereof;

a first temperature detection element that detects a surface temperature of the heat roller at a position
25 where a position in the longitudinal direction of the heat roller corresponds to the center heater;

a second temperature detection element that is

positioned in phase with the first temperature
detection element in the circumferential direction of
the heat roller, and detects a surface temperature of
the heat roller at a position where a position in the
5 longitudinal direction of the heat roller corresponds
to the side heater; and

a control section that controls, when driving of
the heat roller is started by the drive mechanism,
turning the center heater on or off using, as a

10 control-target value of the surface temperature of the
heat roller, a value that is obtained by correcting
a reference control-target value for the surface
temperature of the heat roller on the basis of a
positional relationship between the center heater and

15 the first temperature detection element, and also
controls turning the side heater on or off using, as
a control-target value of the surface temperature of
the heat roller, a value that is obtained by correcting
the reference control-target value for the surface

20 temperature of the heat roller on the basis of a
positional relationship between the side heater and
the second temperature detection element.

4. The fixing device according to claim 3,
wherein after passage of a predetermined time period
25 from the start of driving of the heat roller by the
drive mechanism, the control section controls turning
the center heater or the side heater on or off using

the reference control-target value as a control-target value of the surface temperature of the heat roller, without making said correction.

5 5. The fixing device according to claim 3,
wherein the control section controls turning the center heater or the side heater on or off using, as a control-target value of the surface temperature of the heat roller, a value that is obtained by correcting the reference control-target value on the basis of
10 a correction value that varies stepwise in accordance with an elapsed time from the start of driving of the heat roller by the drive mechanism.

15 6. The fixing device according to claim 3,
wherein the control section controls turning the center heater or the side heater on or off using, as
a control-target value of the surface temperature of the heat roller, a value that is obtained by correcting the reference control-target value on the basis of a
correction value that varies continuously in accordance
20 with an elapsed time from the start of driving of the heat roller by the drive mechanism.

7. A fixing device comprising:
a substantially cylindrical heat roller that is used for fixing toner on paper;
25 a center heater disposed within the heat roller, the center heater being located at a center region in a longitudinal direction of the heat roller and at

a position displaced in a first direction from
a diametrical center position of the heat roller;

5 a side heater disposed within the heat roller,
the side heater being located at a side region in
the longitudinal direction of the heat roller and at
a position displaced in a second direction from the
diametrical center position of the heat roller;

a drive mechanism that rotates the heat roller in
a circumferential direction thereof;

10 a first temperature detection element that detects
a surface temperature of the heat roller at a position
where a position in the longitudinal direction of the
heat roller corresponds to the center heater;

15 a second temperature detection element that is
positioned in phase with the first temperature
detection element in the circumferential direction of
the heat roller, and detects a surface temperature of
the heat roller at a position where a position in the
longitudinal direction of the heat roller corresponds
20 to the side heater; and

a control section that controls, when driving of
the heat roller is stopped by the drive mechanism,
turning the center heater on or off using, as a
control-target value of the surface temperature of
25 the heat roller, a value that is obtained by correcting
a reference control-target value for the surface
temperature of the heat roller on the basis of a

positional relationship between the center heater and the first temperature detection element, and also controls turning the side heater on or off using, as a control-target value of the surface temperature of the heat roller, a value that is obtained by correcting the reference control-target value for the surface temperature of the heat roller on the basis of a positional relationship between the side heater and the second temperature detection element.

10 8. The fixing device according to claim 7, wherein after passage of a predetermined time period from the stop of driving of the heat roller by the drive mechanism, the control section controls turning the center heater or the side heater on or off using the reference control-target value as a control-target value of the surface temperature of the heat roller, without making said correction.

20 9. The fixing device according to claim 7, wherein the control section controls turning the center heater or the side heater on or off using, as a control-target value of the surface temperature of the heat roller, a value that is obtained by correcting the reference control-target value on the basis of a correction value that varies stepwise in accordance with an elapsed time from the stop of driving of the heat roller by the drive mechanism.

25 10. The fixing device according to claim 7,

wherein the control section controls turning the center heater or the side heater on or off using, as a control-target value of the surface temperature of the heat roller, a value that is obtained by correcting the reference control-target value on the basis of a correction value that varies continuously in accordance with an elapsed time from the stop of driving of the heat roller by the drive mechanism.

11. A fixing method for use in a fixing device including a substantially cylindrical heat roller that is used for fixing toner on paper; a center heater disposed within the heat roller, the center heater being located at a center region in a longitudinal direction of the heat roller and at a position displaced in a first direction from a diametrical center position of the heat roller; a side heater disposed within the heat roller, the side heater being located at a side region in the longitudinal direction of the heat roller and at a position displaced in a second direction from the diametrical center position of the heat roller; and a drive mechanism that rotates the heat roller in a circumferential direction thereof, the method comprising:

detecting a surface temperature of the heat roller at a first temperature detection position where a position in the longitudinal direction of the heat roller corresponds to the center heater;

detecting a surface temperature of the heat roller at a second temperature detection position where a position in the longitudinal direction of the heat roller corresponds to the side heater, the second
5 temperature detection position being in phase with the first temperature detection position in the circumferential direction of the heat roller; and

controlling, when driving of the heat roller is started by the drive mechanism, turning the center
10 heater on or off using, as a control-target value of the surface temperature of the heat roller, a value that is obtained by correcting a reference control-target value for the surface temperature of the heat roller on the basis of a positional relationship

15 between the center heater and the first temperature detection position, and also controlling turning the side heater on or off using, as a control-target value of the surface temperature of the heat roller, a value that is obtained by correcting the reference control-
20 target value for the surface temperature of the heat roller on the basis of a positional relationship between the side heater and the second temperature detection position.

12. A fixing method for use in a fixing device
25 including a substantially cylindrical heat roller that is used for fixing toner on paper; a center heater disposed within the heat roller, the center heater

being located at a center region in a longitudinal direction of the heat roller and at a position displaced in a first direction from a diametrical center position of the heat roller; a side heater
5 disposed within the heat roller, the side heater being located at a side region in the longitudinal direction of the heat roller and at a position displaced in a second direction from the diametrical center position of the heat roller; and a drive mechanism that rotates
10 the heat roller in a circumferential direction thereof, the method comprising:

detecting a surface temperature of the heat roller at a first temperature detection position where a position in the longitudinal direction of the heat
15 roller corresponds to the center heater;

detecting a surface temperature of the heat roller at a second temperature detection position where a position in the longitudinal direction of the heat roller corresponds to the side heater, the second
20 temperature detection position being in phase with the first temperature detection position in the circumferential direction of the heat roller; and

controlling, when driving of the heat roller is stopped by the drive mechanism, turning the center
25 heater on or off using, as a control-target value of the surface temperature of the heat roller, a value that is obtained by correcting a reference

control-target value for the surface temperature of the
heat roller on the basis of a positional relationship
between the center heater and the first temperature
detection position, and also controlling turning the
5 side heater on or off using, as a control-target value
of the surface temperature of the heat roller, a value
that is obtained by correcting the reference control-
target value for the surface temperature of the heat
roller on the basis of a positional relationship
10 between the side heater and the second temperature
detection position.

13. An image forming apparatus that forms an image
on paper, comprising:

a toner image forming section that forms a toner
15 image on paper;

a substantially cylindrical heat roller that is
used for fixing on the paper the toner image which is
formed on the paper by the toner image forming section;

a center heater disposed within the heat roller,
20 the center heater being located at a center region in
a longitudinal direction of the heat roller and at
a position displaced in a first direction from
a diametrical center position of the heat roller;

a side heater disposed within the heat roller,
25 the side heater being located at a side region in
the longitudinal direction of the heat roller and at
a position displaced in a second direction from the

diametrical center position of the heat roller;

5 a first temperature detection element that detects
a surface temperature of the heat roller at a position
where a position in the longitudinal direction of the
heat roller corresponds to the center heater; and

10 a second temperature detection element that is
positioned in phase with the first temperature
detection element in a circumferential direction of the
heat roller, and detects a surface temperature of the
heat roller at a position where a position in the
longitudinal direction of the heat roller corresponds
to the side heater.